



Air Vehicles News and Accomplishments

July 2010



Col Kenneth Echternacht, Col Michael Hatfield, Dr. Leslie Perkins, Mr. Joe Sciabica, Ms. Susan Thornton, and Dr. Gregg Abate (left to right) cut the ribbon on the Micro Air Vehicle Integration and Application Research Institute Indoor Flight Test Laboratory during a ceremony held May 27, 2010.

AFRL cuts ribbon on new Micro Air Vehicle research facility

In a ceremony held May 27, 2010, AFRL Executive Director Joe Sciabica cut the ribbon on the Micro Air Vehicle Integration and Application Research Institute (μ AVIARI) Indoor Flight Test Laboratory, a new \$1.5 million facility dedicated to the advancement of Micro Air Vehicle (MAV) technologies.

Addressing the gathering, Sciabica emphasized the collaborative nature of the state-of-the-art laboratory, stating, "This facility that we're dedicating here today is a facility for all of us to use and share." He added that the MAV technologies developed within the lab are expected to benefit both military and commercial applications.

The new Indoor Flight Test Laboratory is the cornerstone of the μ AVIARI, a facility that combines four distinct MAV development labs into one building. In addition to the Indoor Flight Lab, the μ AVIARI includes: the Unsteady Aerodynamics Laboratory, the MAV Fabrication Laboratory, and the Flapping Wing Bench Test Laboratory. These labs allow scientists to research, design, fabricate, and test MAVs from start to finish. They also allow for the separation of airframe development from sensor, communication, and payload development, meaning these technologies can be developed independently and simultaneously.

MAVs are an emerging technology for the urban battlefield. These flight vehicles—less than two feet in length and potentially as small as a dragonfly—are designed to be able to enter an urban setting and loiter virtually unnoticed, allowing them to perform missions too difficult or dangerous for troops.

The Indoor Flight Test Laboratory allows researchers to simulate an urban environment, complete with building fronts and controlled winds.

Composed of a test chamber and a separate control room, the Indoor Flight Laboratory provides a test environment in which researchers can record the motion of MAV flight using the VICON camera system. Using the same type of technology employed by video game developers to animate human beings, reflectors placed on MAVs allow the cameras to track position and orientation of the vehicle with an accuracy of approximately one millimeter.

Calling the new flight lab "the beginning of a new chapter in the history of our directorate, AFRL, and flight research as a whole," Colonel Michael Hatfield, AFRL Air Vehicles Materiel Group Director and AFRL Wright-Site Commander, spoke to the crowd, describing the flight lab as a unique environment that will bring together all aspects of MAV development.

Although MAV technology isn't expected to be fully matured until approximately 2030, Dr. Greg Parker, AFRL Air Vehicles Directorate MAV Team Lead, says much research has already been conducted in the μ AVIARI, which is housed in a recently-renovated former structural testing facility.

According to Parker, researchers are already using the Indoor Flight Lab for controls development and vehicle performance testing. Testing is currently planned for summer 2010 in the areas of performance testing, sensor testing, controls development, and power development.

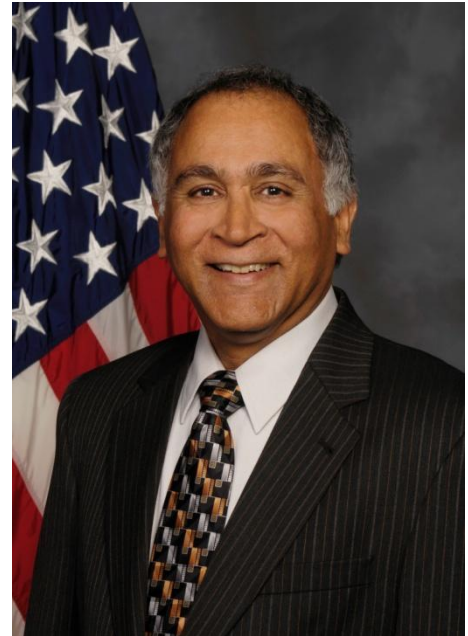
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Dr. Siva Banda honored as Distinguished Senior Professional

Dr. Siva S. Banda, Director of the US Air Force Center of Excellence in Control Science at AFRL, earned the Presidential Rank Award of Distinguished Senior Professional. Secretary of the Air Force Michael Donley presented Dr. Banda with the prestigious award during an April 30, 2010 ceremony held at the auditorium of the Women's Memorial at Arlington National Cemetery.

Distinguished Senior Professional is the highest annual award for senior-level/senior technical career professionals. It is bestowed upon Federal executives who have demonstrated a consistent level of extraordinary achievement. Only one percent of career Senior Executive Service professionals may receive this honor.

During his nearly 30-year career as an AFRL scientist, Dr. Banda has led many groundbreaking research efforts. He assembled the Center of Excellence in Control Science, a world-class university, industry, and government team focused on Air Force-critical control science challenges. This team of over 70 scientists, engineers, and researchers has devised technologies for tailless flight, space access, Unmanned Air Vehicles (UAVs), and numerous other military applications critical to 21st century capabilities.



Dr. Siva Banda was recently honored with the 2010 Presidential Rank Award of Distinguished Senior Professional.



Secretary of the Air Force Michael B. Donley (left) presents the Distinguished Senior Professional Award to Dr. Siva Banda, with Chief of Staff of the Air Force General Norton Schwartz standing alongside.

Recognizing the benefits of using unmanned aircraft in the urban battlefield, Dr. Banda crafted and executed a research and development strategy for enhanced autonomous and cooperative control of UAVs. This technology advances the future capability of teams of UAVs to conduct missions working in conjunction with one another, thereby greatly enhancing unmanned capabilities.

Dr. Banda's research extends into Micro Air Vehicle (MAV) technologies as well. He led an international joint development team that developed control strategies for MAVs in urban operations. MAVs, vehicles measuring two feet in length or less, have the potential to provide game-changing new tools for intelligence, surveillance, and reconnaissance in the urban battlefield.

Dr. Banda's research has had far-reaching impact, both nationally and internationally. The results of his work have been applied to current Army, Air Force, & Marine small UAV operations. Additionally, his research has

been applied during the 2007 and 2009 US-Australia Talisman Saber Exercise, the largest joint warfighting exercise in the Pacific and a key demonstration showcasing UAV technologies.

Dr. Banda is a recipient of multiple awards and recognitions, including the Institute of Electrical and Electronics Engineers (IEEE) Control Systems Technology Award; the Royal Aeronautical Society (RAeS) Silver Medal; the Meritorious Presidential Rank Award; election as a Fellow of RAeS, the American Institute for Aeronautics and Astronautics, and IEEE; and Membership in the National Academy of Engineering.

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